



Extraction of Decayed and Dilapidated First Permanent Molars in Mixed Dentition and Spontaneous Space Closure: A Case Report

Zaroui Jihène¹, Jazi Imene¹, Jemmali Badiaa²

¹Assistant Professor in Pediatric Dentistry, Faculty of Dentistry of Monastir, Tunisia; ²Professor in Pediatric Dentistry, Faculty of Dentistry of Monastir, Tunisia.

ABSTRACT

The replacement of dilapidated or already extracted first permanent molars (FPMs) is the subject of multidisciplinary discussion. Many treatment options are considered to restore a dilapidated FPM like: crown restoration after an endodontic treatment or, replace an extracted FPM like: space maintainer or orthodontic treatment for space closure.

This case-report described another alternative of treatment in which spontaneous space closure (SSC) is obtained after extraction of first permanent molars in mixed dentition.

Indeed, if some conditions are reunited, the SSC by the eruption of the second permanent molars, which will take up the position of extracted first permanent molars and the spontaneous position of the wisdom tooth, constitute the best choice.

Key Words: Extraction, First permanent molars, Space closure, Mixed dentition

INTRODUCTION

First permanent molars are frequently affected by caries and are quoted as being the most caries-prone in the permanent dentition.¹

This can be explained by the high susceptibility of these teeth to dental caries due to: an early exposure to the oral environment unperceived by the parents, a slow eruption which can last from 5 to 32 months, an anfractuous occlusal surface and an immature and porous enamel.^{2, 3, 4}

FPMs can also be severely affected by molar-incisor hypomineralization (MIH) and aggressive periodontitis.⁵

Applying preventive measures of dental caries in newly erupted first permanent molars would greatly save those teeth and thus help practitioner avoid many dilemmas in the clinical management of gross carious lesions, which may render the teeth not restorable.⁶

Improvements in restorative techniques and high parental expectations lead to heavily restored teeth.¹

FPMs will enter the restorative cycle, in deed, large amalgam and composite restorations generally have limited life and need to be replaced within 5-10 years because of the possibility of secondary caries.⁶

The second cavity preparation will need to be larger than the first due to the necessity to remove more carious structure, and this undoubtedly weakens the remaining tooth substance and thus threatens the life of the molar's pulp. Besides, endodontic treatment of molar teeth has a relatively high failure rate which usually increases the later risk of tooth loss.⁶

In the right circumstances, first permanent molar extraction can be followed by successful eruption of the second permanent molar to provide a suitable replacement, and ultimately third molar eruption to complete the molar dentition, but it's not guaranteed.⁷

Corresponding Author:

Zaroui Jihène, Assistant Professor in Pediatric Dentistry, Faculty of Dentistry of Monastir, Tunisia;
Email: jihenezaroui@hotmail.fr

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That's why the timing and consequences of FPM's extractions should well studied and based on adequate diagnosis and case analysis.^{6,8,9}

CASE REPORT

9.4 years-old-male with hypothyroidism, growth retardation was referred to our clinic because of many caries lesions and dilapidated first permanent molars. He was not schooled and belonged to a low socioeconomic status and had bad oral hygiene.

Three first permanent molars 16, 26, 46 had poor prognosis with repetitive abscess (Fig. 1).

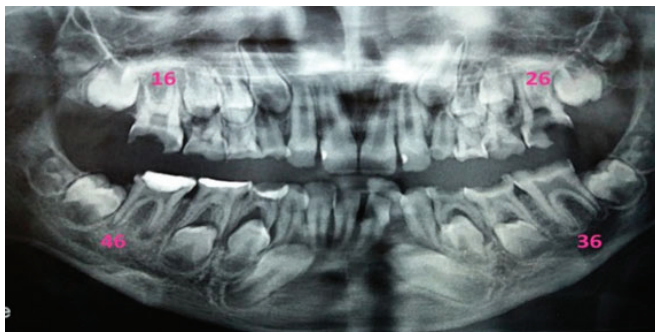


Figure 1: 9.4 years (bone age: 8 years) Many caries lesions and 16, 26, 46 with poor prognosis.

The dental age determined by the hand X-ray was 8 years and didn't match with the civil age (Fig. 2).



Figure 2: Bone age: 8 years (Greulich-Pyle method).

In order to postpone the loss of molars, we decide to try endodontic treatment on 16 and 46. The patient was not cooperative and didn't show cooperation to the oral hygiene instructions and appointments.

One year later, we decided to extract the four FPM's (Fig. 3).

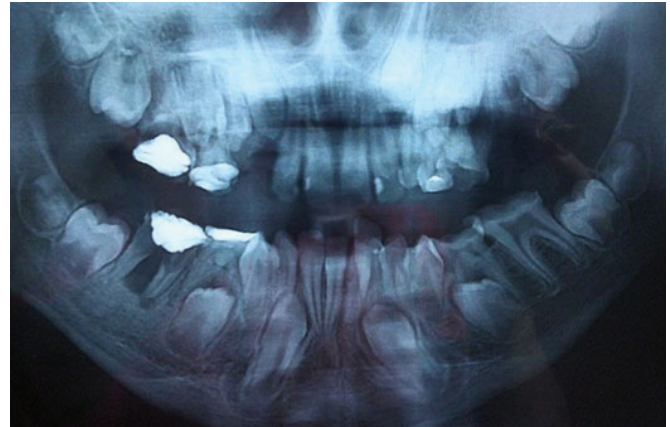


Figure 3: 10.4 years decision of extraction of the four first permanent molars.

The patient may never be expected to consult an orthodontist as he belongs to a low socioeconomic status.

The second permanent molar has not yet erupted (immature tooth: Nolla 6) and wisdom teeth were in correct morphology and well position (Fig. 3).

In these conditions, we hoped for a successful eruption of the second permanent molar to provide a suitable replacement, and ultimately third molar eruption to complete the molar dentition.

After six months and one-year follow-up, the x-ray control showed a completely spontaneous mesialization of the second maxillary permanent molars and space closure contrary to a long-lasting mesialization of the second mandibular permanent molars (Fig. 4, 5, 6).

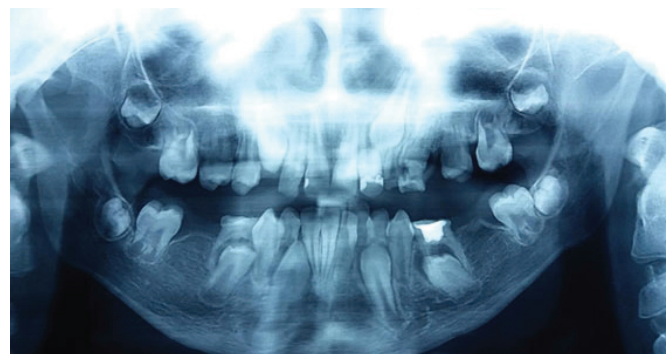


Figure 4: 6 months follow-up: space closure is almost achieved on the maxilla.

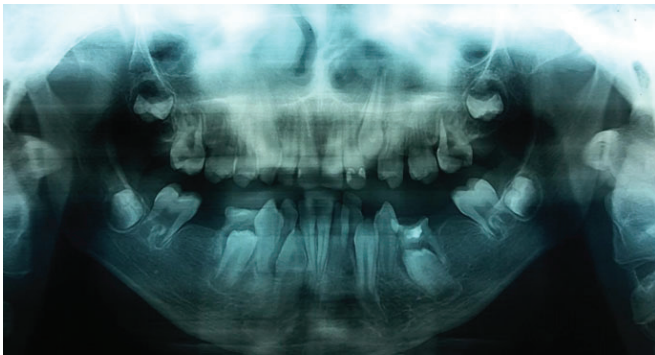


Figure 5: One year follow-up: mesialization of the mandibular second molars is long-lasting compared with the maxillary mesialization of the second molars.

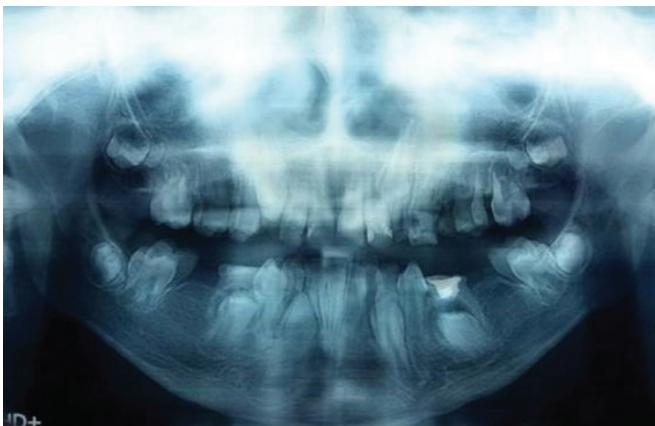


Figure 6: Superposition of 2 panoramic radiographs at 6 and 12 months follow up.

DISCUSSION

Good SSC can be expected when extracting a FPM prior to eruption of the permanent second molar and in the presence of correct morphology and well-positioned wisdom tooth germ.

It constitutes a natural rehabilitation whose longevity of which is verifiable, without prosthetic artifices or implant.²

In our case-report, the spontaneous mesialization of the second maxillary permanent molars was very satisfactory contrary to the second mandibular molars, which was long lasting and associated to mesial tilting, as mentioned in the literature. The SSC on the mandibular will take more time.

However, before extraction it is necessary to check the following points: restorative state of the FPM's, dental age of the patient, the presence of crowding and malocclusion, presence and condition of the other teeth, socio-economic level and patient and parents motivation.²

On the maxilla, the spontaneous mesialization of the second molar satisfactorily occurs until the age of 12 years of dental

age. After that age, the rotation of the second molar around its palatal root is pronounced. A moderate distal translation of the second premolar occur but not systematic.^{2, 5, 8}

In the mandible, the consequences are much less satisfactory. Spontaneous mesialization of the second molar is very often associated to a mesial tipping and a disto-buccal rotation. A significant distal translation occurs with an appearance of a diatema.^{2,8,7}

Offman1987 we shall look for a spontaneous mesialization of one or several second molars, in the maxilla.

In the mandible, the mesialization is rather satisfactory until 9-10 years of dental age although the tooth-buds of the last molars are hardly visible at this age.^{2,9,10}

CONCLUSION

Treatment planning for the enforced extraction of first permanent molars can present a complex problem.

In the right circumstances, FPM can be followed by successful eruption of the second permanent molar to provide a suitable replacement, and ultimately third molar eruption to complete the molar dentition.^{3, 6}

Orthodontic closure of the extraction space can be another alternative of treatment.

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